

Report Documentation Page				Form Approved OMB No. 0704-0188	
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1. REPORT DATE <b>01 JUL 2008</b>		2. REPORT TYPE <b>N/A</b>		3. DATES COVERED <b>-</b>	
4. TITLE AND SUBTITLE <b>The evolution of military trauma and critical care medicine: applications for civilian medical care systems</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) <b>Grathwohl K. W., Venticinque S. G., Blackbourne L. H., Jenkins D. H.,</b>				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>United States Army Institute of Surgical Research, JBSA Fort Sam Houston, TX 78234</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release, distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>UU</b>	18. NUMBER OF PAGES <b>2</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

# The evolution of military trauma and critical care medicine: Applications for civilian medical care systems

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**I**bn Sina Hospital in Baghdad, Iraq, has been occupied by American combat support hospital staff since 2003 (Figure 1). The facility is named after the Persian physician, Abu Ali al-Husain ibn Abdallah Ibn Sina, who lived between 900 and 1037 A.D. He is credited with writing one of the world's most important medical texts, the *al-Qanun*, which described all known diseases, including both physical and mental, methods of treatment, and over 760 medications. This text remained the medical guide to Western medicine through the 18th century. Ibn Sina, considered one of the fathers of early modern medicine, has also been attributed with beginning systematic experimentation and evidence-based medicine (1, 2).

Like great leaders in medicine such as Ibn Sina, war and conflict have also been credited with advances in medical and surgical therapy throughout the centuries. Like in previous conflicts, many authors note that innovations in trauma and critical care evolving from the current global war on terrorism may significantly impact civilian trauma care, crit-

ical care, and disaster medicine. War likely contributes to medical advances because it causes an eruption of necessity. Age-old problems such as hemorrhage, infection, and organ dysfunction after injury are magnified during war. Medical challenges include the need to provide high-level care in the most austere of settings as well as the urgency and impetus to develop creative and innovative approaches to these and new problems. The hope is that our lessons learned during conflict and our resultant innovations will, in fact, translate into lives saved and improvements realized now and in the future for all of mankind. Because the challenges faced in war and conflict parallel, many of those that can be anticipated during large-scale environmental and terrorist disasters, these lessons learned will also hopefully prepare us to better deal with these problems as well. With that being said, the goal of this supplement is to describe the recent efforts and experiences of military health-care providers to improve the outcomes of severely injured combat-related casualties. We realize that a majority of these articles are descriptive and not subject to rigorous clinical scrutiny or formatted to follow established experimental design. Historically, military medical providers have provided anecdotes, summarized their data, and reviewed outcomes years after conflicts have passed and then tried to arrive at meaningful conclusions. A major difference in the global war on terrorism compared with prior conflicts is the focus on real-time data collection, the deployment of dedicated researchers, and the prompt application of data to improve the quality of care within the theater trauma system. Currently, and with good reason, federal law limits experimentation in the combat zone. In 2004, however, physicians from the 31st combat support hospital supported by the U.S. Institute of Surgical Research (USAISR) formed a research group to col-



Figure 1. Photograph of Ibn Sina Hospital, Baghdad, October 2004.

lect and subsequently retrospectively evaluate data approved by an Institutional Review Board. Largely as a result of their efforts, and continued support by the USAISR, the management of combat casualties continues to evolve. Some of these data are presented in this supplement, and some has been discussed at various meetings and presented in other journals.

Admittedly, collecting and evaluating data from a combat zone is problematic. The U.S. military and the USAISR continue to improve the processes, accuracy, and validity of data being collected and evaluated. To this end, the USAISR has deployed research teams including registrars to all combat support hospitals in the war zone as well as Landstuhl Regional Medical Center, Germany, and to all U.S. military medical centers. Additionally, there is increasing collaboration between the Veterans Administration hospitals and civilian centers to ensure comprehensive data sets. We acknowledge the problems associated with the collecting retrospective data in this environment, including the significant confounders and changing variables like personnel rotations, logistics, and tactics. The conclusions from some of the early data described here should in no way be construed to be definitive until they are further evaluated with rigorous experimental design and analysis. However, this should

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The authors have not disclosed any potential conflicts of interest.

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DOI: 10.1097/CCM.0b013e31817e325a

not dilute our message in detailing the evolving practices that have occurred as a result of the military experiences over the last 5 yrs. Truth be told, a majority of the advances in trauma and critical care we outline here simply represent the application of practices routinely performed day to day in civilian medical centers applied instead to the austere settings we often find ourselves in.

In presenting this supplement, we are indebted to all of our civilian medical colleagues who deploy as reservists or support the military's continued search for improvements in medical care and the outcomes of wounded warriors and civilians affected by war. Finally, we are indebted to the American people, our coalition partners, their families, and the soldiers to whom we dedicate this supplement.

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